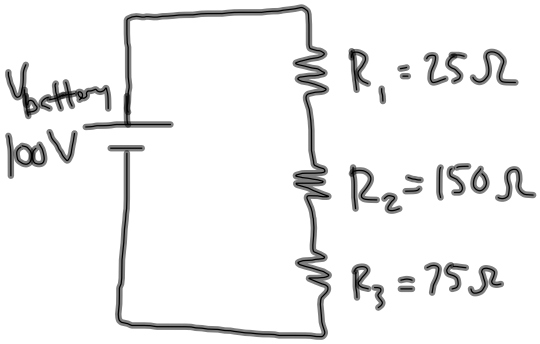
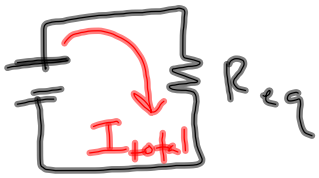
# Circuit Practice:

Find V's and I's of all resistors




$$R_{eq} = R_1 + R_2 + R_3$$
$$= 250\,\Omega$$

$$I_{total} = \frac{V_{battery}}{R_{eq}} = \frac{100\,V}{250\,\Omega} = 0.4\,A$$


$$V_1 = I_{total} R_1 = 10\,V$$
$$V_2 = I_{total} R_2 = 60\,V$$
$$V_3 = I_{total} R_3 = 30\,V$$

$V_1 = 10\,V$ $V_2 = 60\,V$ $V_3 = 30\,V$

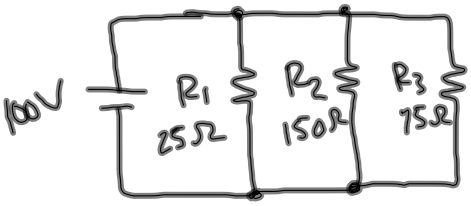
$I_1 = 0.4A$ $I_2 = 0.4A$ $I_3 = 0.4A$

## Steps:

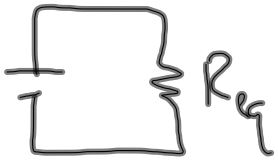
1. Find equivalent resistance of the circuit.

2. Calculate total current from $I_{total} = \frac{V_{battery}}{R_{eq}}$.

3. Work backwards to find individual voltage drops and currents.




Find I's and V's of resistors



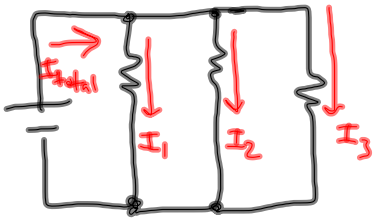

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$R_{eq} = 16.67\ \Omega$$

$$((1/25) + (1/150) + (1/75))^{-1}$$

$$I_{total} = \frac{V_{battery}}{R_{eq}} = 5.998\ A$$

$$V_1 = V_2 = V_3 = 100\ V$$

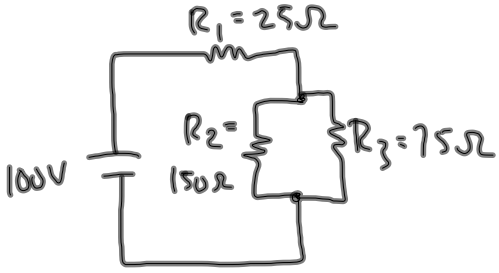



$$I_1 = \frac{V_1}{R_1} = 4\ A$$

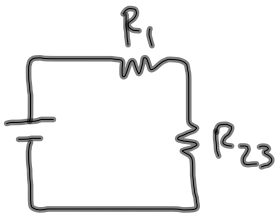
$$I_2 = \frac{V_2}{R_2} = 0.67\ A$$

$$I_3 = \frac{V_3}{R_3} = 1.33\ A$$

**Circuit Practice 5.10.12 Honors Physics**

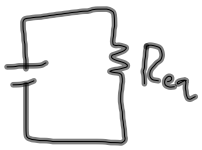



find I's and V's of resistors




$$\frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3}$$

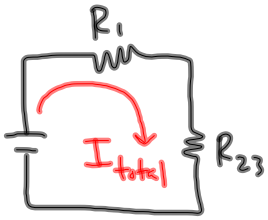
$$R_{23} = 50\,\Omega$$




$$R_{eq} = R_1 + R_{23}$$

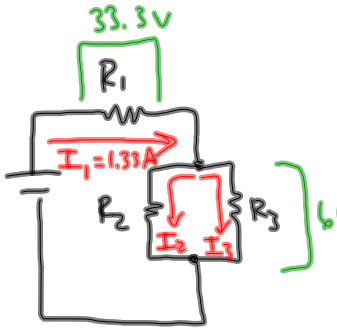
$$= 75\,\Omega$$

$$I_{total} = \frac{V_{battery}}{R_{eq}} = \frac{100\,V}{75\,\Omega} = 1.33\,A$$




$$V_1 = I_{total} R_1 = 33.3\,V$$

$$V_{23} = I_{total} R_{23} = 66.7\,V$$



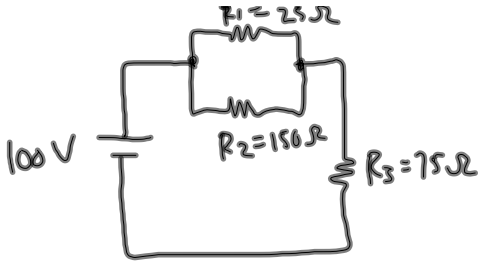

$$I_2 = \frac{V_{23}}{R_2} = 0.44A$$

$$I_3 = \frac{V_{23}}{R_3} = 0.88A$$

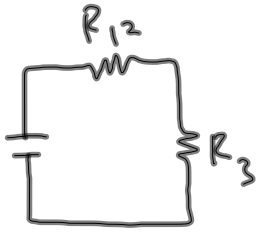
$V_1 = 33.3\,V$ $V_2 = 66.7\,V$ $V_3 = 66.7\,V$

$I_1 = 1.33\,A$ $I_2 = 0.44\,A$ $I_3 = 0.88\,A$

**Circuit Practice 5.10.12 Honors Physics**

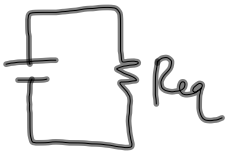



find all V's and I's



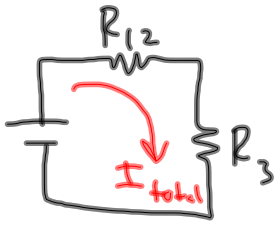

$$\frac{1}{R_{12}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$R_{12} = 21.4\,\Omega$$




$$R_{eq} = R_{12} + R_3$$
$$= 96.1\,\Omega$$

$$I_{total} = \frac{V_{battery}}{R_{eq}} = 1.04\,A$$




$$V_{12} = I_{total} R_{12} = 22.2\,V$$

$$V_3 = I_{total} R_3 = 77.8\,V$$


$$I_1 = \frac{V_{12}}{R_1} = 0.88\,A$$

$$I_2 = \frac{V_{12}}{R_2} = 0.15\,A$$

$V_1 = 22.2\,V$ $V_2 = 22.2\,V$ $V_3 = 77.8\,V$

$I_1 = 0.88\,A$ $I_2 = .15\,A$ $I_3 = 1.04\,A$